

PSU
Guidelines for Graduate Certificates

1. **Definition.** A graduate certificate program is a linked series of graduate level courses which constitutes a coherent body of study with a specific defined focus within a discipline. It is designed for a post-baccalaureate participant and reflects the educational mission of the University.
2. **Curriculum and Scope.** A graduate certificate curriculum is a structured progression or collection of fully approved courses offered for graduate degree credit. It consists of a minimum of 15 quarter term credits. The curriculum may include a final project or portfolio to provide for integration of the sequence of course materials.
3. **Admissions.** Students must be admitted to the graduate certificate program by the University and must meet standards for admission to allied graduate degree programs (e.g., master's or doctoral level programs). Minimally this requires an accredited baccalaureate degree and an acceptable grade point average. Programs may specify additional requirements. Students may be admitted as graduate degree students (e.g., concurrently admitted to a master's or doctoral program) or admitted to the University as a graduate certificate student only.
4. **Award and Transcript.** Courses and graduate certificates completed will be transcribed by the University Registrar as part of the student's permanent University record. Students must apply for award of the graduate certificate, which may be awarded at any time the requirements are met. A cumulative Grade Point Average of 3.00 must be attained in all courses to be used for the certificate. A cumulative Grade Point Average of 3.00 must be attained for overall PSU graduate performance.
5. **Integration with Degree Programs.** Credits earned in fulfillment of a graduate certificate program may be applied to a graduate degree program (e.g., M.A., M.S., other master's degree, Ph.D., Ed.D.). Courses completed for a graduate degree program may be applied to completion of the graduate certificate program. Courses completed up to seven years prior to the graduate certificate award date may be used to satisfy graduate certificate requirements. All courses taken for completion of a graduate certificate program may be used for graduate degree credit, so long as they meet all appropriate standards for use in the degree (including acceptable grade and completion within seven years of degree award date for the master's degree).
6. **Approval.** Before offering graduate certificates, each program must be proposed by a department or program or by a combination of departments and/or programs; be reviewed and approved by the appropriate School or College committee(s); and receive approval from the Graduate Council, the Faculty Senate, and the Office of Academic Affairs. The Oregon University System requires regular program approval procedures.
7. **Transfer Credits for Graduate Certificate Programs.** Two-thirds of the credits required for a graduate certificate, or 15 credits, whichever is greater, must be taken at PSU. Individual departments may set higher minimums. Transfer credit for graduate certificate programs *only* is defined as any eligible course taken at another accredited institution.

**PSU Computer Science
Computer Security Graduate Certificate Program
Portland State University
College of Engineering and Computer Science
Computer Science
[CIP Code -- OGS will arrange for this after program approval]**

DESCRIPTION OF PROPOSED PROGRAM

1. Program Overview

The proposed program provides a thorough grounding in computer security and the related foundational areas of computer science. The 21 credits (7 courses) cover topics that make up the requirements for NSTISSC training standard 4011, as certified by the National Security Agency, as well as additional topics of use to the computer security professional. Computer security issues impinge on many areas of computer science, but particularly on software engineering and systems, two areas in which our department is strong. The program leans more towards the systems side but offers ample electives for students interested in the software aspects of security.

Computer security has long been recognized as a weak point in the nation's readiness to deal with threats from criminals and terrorists. Individual systems in businesses and government agencies and the networks that connect them are all at risk. More research and development needs to be done to create more secure and reliable systems, and more trained people are needed to do the research and implement better practices and systems as they are developed. Trained people are also needed to investigate computer-related crimes and bring the miscreants to justice.

The Computer Science Department at Portland State University is strongly engaged in addressing this situation. Our curriculum has been certified by the NSA with the award of a Center of Excellence in Information Assurance Education, and our faculty are involved in computer-security related research and outreach to our community. This certificate builds on our strengths to support the recruitment and training of additional students in the computer security area. There are no related degrees at present.

2. Purpose and Relationship of Proposed Program to the Institution's Mission and Strategic Plan

The program is designed to educate professionals for the IT security workforce in the area of computer security and forensics.

The department has developed a specialization in computer security, which promises to be a growth area for computer science, one that is relatively immune to the overseas outsourcing phenomenon. Our faculty also find many problems of great intellectual interest related to computer security.

Given the concentration of computer security industry in the region, the program contributes to the mission of the University and College by providing highly skilled professionals to support this growth area of the Oregon economy. This responds to the mission of providing professional and graduate programs especially relevant to the metropolitan area.

There are over 60 companies in the Metro area that are in the security field, so this program is very responsive to the needs of local industry. We have attached letters of support from industry and police that were provided for recent grant proposals in the computer security area. Please note that Oregon RAINS is a consortium of many companies in the security area.

3. Course of Study

The certificate consists of 21 hours with two components, a required core of classes, and a set of electives. The student must take the required core of 5 classes (15 hours), and 2 electives for 6 hours, with 21 hours total in the program. All listed classes are three credits.

The required core consists of 15 hours including the following classes:

1. CS 533 Concepts of Operating Systems. This class is also a core M.S. requirement. A thorough understanding of operating systems is fundamental to computer security.
2. CS 591 Introduction to Computer Security. This class and the next class are the foundation for most if not all security classes. This class is a broad overview of computer security and in and of itself satisfies the Federal National training standard NSTISSI No. 4011.
3. CS 594 Internetworking Protocols. This class is a basic introduction to networking and provides foundation concepts for security-oriented students.
4. CS 596 Network Security. This class covers network security issues such as various types of attacks, firewalls and other defenses, and new developments in secure protocols.
5. A technical communications class such as OMSE 513 (Professional Communication Skills for Software Engineers). This class is only taught once every two years, so other communications classes that focus on team communication or written communication will also be accepted. These classes include:

1. Engineering Mgmt. 522, Communication and Team Building in Engineering Mgmt.
2. English, 525, Advanced Technical Writing.

The electives are as follows:

1. one software engineering course such as
 1. CS 554 Software Engineering or
 2. CS 555 Software Specification and Verification
2. CS 576 Computer Security Seminar
3. CS 585 Cryptography
4. CS 510 Computer Forensics
5. CS 592 Applied Computer Security.
6. AJ 515 Theories of Crime and Justice (from the PSU Criminology and Criminal Justice Division - Hatfield School of Government. They have approved the notion that our students could take this class.)